

## MEDB 5.4 Calf Volume Measurement

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SLSDCR-

SMCCB-07-060

### 3.2 Medical Requirements Overview

**TABLE 3.2: MEDICAL REQUIREMENTS OVERVIEW**

<b>MEDB# and Title:</b>	MEDB 5.4 Calf Volume Measurement
<b>Sponsor:</b>	GMO (Russian Medical Support Group), IBMP (Institute of Biological Medical Problems)
<b>Discipline:</b>	Bone, muscle and exercise
<b>Category:</b>	Medical Requirements (MR) - Russian
<b>References:</b>	SSP 50667 Med Volume B Russian ISS Medical Monitoring Plan
<b>Purpose/Objectives:</b>	Muscle atrophy evaluation – microgravity causes calf muscle atrophy and objective measurement may guide in-flight countermeasures.
<b>Measurement Parameters:</b>	Values from the borderline between elastic and non-elastic elements.
<b>Deliverables:</b>	Data logged in IFEP on MEC and downlinked via OCA on test day (may be called down during comm. pass by voice or e-mail); than processed by GMO.
<b>Flight Duration:</b>	>30 days
<b>Number of Flights:</b>	All flights
<b>Number and Type of Crew Members Required:</b>	All crewmembers
<b>Other Flight Characteristics:</b>	N/A

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**3.3 Preflight Training****TABLE 3.3: PREFLIGHT TRAINING**

Preflight Training Activity	Description:	Measuring calf volume is scheduled and conducted by the GCTC personnel in Star City			
		Duration:	Schedule:	Flexibility:	Personnel Required:
	Schedule:	Calf measurement – 00:15	L-90 days	±90 days	Medical Instructor
Ground Support Requirements Hardware/Software	Preflight Hardware:	Preflight Software:		Test Location:	
	Calf volume measurement set (ИЗОГ/EZOG), Russian Segment ODF “Medical Operations”	N/A		Room for biomedical testing	
Training Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:	
	20m <sup>2</sup>	N/A	20°C ±5°	N/A	
	Hot or Cold Running Water:	Privacy Requirements:	Other:		
	N/A	N/A	N/A		
Constraints/Special Requirements:	N/A				
Launch Delay Requirements:	N/A				
Notes:	N/A				

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**3.4 Preflight Activities****TABLE 3.4: PREFLIGHT ACTIVITIES**

Preflight Activity	Description:	Measuring calf volume is scheduled and conducted by the GCTC personnel in Star City. One measurement is required pre-flight to manufacture the individual device.			
	Schedule:	Duration:	Schedule:	Flexibility:	Personnel Required:
		00:15	L-180 days	± 30 days	Medical Instructor IBMP representatives Crewmember
Ground Support Requirements Hardware/Software	Preflight Hardware:	Preflight Software:		Test Location:	
	Calf volume measurement set (ИЗОГ/EZOG)		N/A		Room for biomedical testing
Testing Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:		Temperature Requirements:	Special Lighting:
	20m <sup>2</sup>	N/A		20°C ±5°	N/A
	Hot or Cold Running Water:	Privacy Requirements:		Vibration/Acoustic Isolation:	Other:
	N/A	Obtained data is secured information		N/A	N/A
Constraints/Special Requirements:	N/A				
Launch Delay Requirements:	N/A				
Notes:	N/A				
Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):				
	Crew surgeon will receive a data processed by GMO.				

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## 3.5 In-Flight Activities

**TABLE 3.5.1: IN-FLIGHT ACTIVITIES**

<b>In-Flight Activity</b>	<b>Description:</b>	Requirement – Each crewmember shall have his/her calf volume measured during flight. Calf volume is measured using a special individual stocking-type device calibrated for each crewmember.					
	<b>Schedule:</b>	<b>Activity:</b>	<b>Duration:</b>	<b>Schedule:</b>	<b>Flexibility:</b>	<b>Blood Volume:</b>	<b>Personnel Required:</b>
		Calf Measurement EZOG	00:10/crewmember	L+14 days, then every 2 weeks in-flight	as clinically indicated	N/A	All crewmembers
<b>Procedures:</b>		RODF MO Book 2: Measuring Calf Volume					
<b>Constraints / Special Requirements:</b>		In post-sleep prior to breakfast & with Body Mass Measurement (MEDB 1.13).					
<b>Photo / TV Requirements:</b>		N/A					
<b>Cold Stowage Requirements:</b>		N/A					
<b>Mission Extension Requirements:</b>		N/A					
<b>Landing Wave-Off Requirements:</b>		N/A					
<b>Data Delivery</b>		<b>Data/Report to Designated Recipients (Nominal/Contingency):</b>					
		Data logged in IFEP on MEC and downlink via OCA on test day (may be called down during comm. pass by voice or by e-mail). Crew surgeon and designated recipients will receive data after processing by GMO.					

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### In-Flight Activities, (cont.)

**TABLE 3.5.2: IN-FLIGHT HARDWARE**

Hardware/Software Name	P/N
Calf Volume Measurement Device (EZOG)	Xt2.787.001

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**3.6 Summary Schedule****TABLE 3.7: SUMMARY SCHEDULE**

ACTIVITY	DURATION	SCHEDULE	FLEXIBILITY	BLOOD VOLUME	PERSONNEL REQUIRED	CONSTRAINTS
<b>Preflight Training</b>						
Calf Volume Measurement training	00:15	L-90 days	± 90 days	N/A	Medical Instructor	N/A
<b>Preflight</b>						
Measuring Calf Volume & Calibration of stocking-device	00:15	L-180 days	± 30 days	N/A	Medical Instructor IBMP representatives Crewmember	N/A
<b>In-Flight</b>						
Calf Measurement EZOG	00:10/crewmember	L+14 days, then every 2 weeks in-flight	as clinically indicated	N/A	All crewmembers	In post-sleep prior to breakfast and BMM (MEDB 1.13)
<b>Postflight – N/A</b>						
<b>Postflight Debrief – N/A</b>						